part of at least one surface of the shaped body, whereby the coating material melts at least partially at a lower temperature than the material of the shaped body, whereby the shaped body together with the applied coating material is heated to a desired temperature at which the material of the shaped body does not yet partially melt but at which the material of the shaped body is at least partially softened by the heat, and whereby at least one part of a region of the shaped body located near the surface is modified at a temperature at a temperature at least as high as said desired temperature, in that the coating material at least partially infiltrates the region of the shaped body located near the surface, and wherein the shaped body treated in such a manner is enriched with oxygen whereby the modification contributes to the increase in at least one of the remanent induction and the critical current density of the shaped body enriched with oxygen.

2. (Amended) A method in accordance with Claim 1, characterised in that the superconducting material contains at least one of said group of elements and also at least barium, copper and oxygen and optionally elements selected from the group consisting of Be, Mg, Ca, Sr, Zn, Cd, Sc, Zr, Hf, Pt, Pd, Os, Ir, Ru, Cu, Ag, Au, Hg, Tl, Pb, Bi and S.

3. (Amended) A method in accordance with claim 1, characterised in that the shaped body of the superconducting material was produced by a process selected from the group consisting of a melt-texturising process, a zone-melting process, a single crystal growth process or by producing a texturised polycrystalline superconducting material.

4. (Amended) A method in accordance with claim 1, characterised in that the shaped body of the superconducting material comprises one to one hundred grains or/and one to one hundred domains, preferably just one grain and up to four domains.

5. (Amended) A method in accordance with claim 1, characterised in that at least one of the untreated shaped body of the superconducting material, the treated shaped body of the superconducting material, the coating material and the layer of material includes phases which are selected from the group of phases corresponding to an approximate composition of $Y_1Ba_2Cu_3O_v$, $Y_2Ba_1Cu_1O_w$, $Yb_1Ba_2Cu_3O_{v'}$, $Yb_2Ba_1Cu_1O_{w'}$, $Er_1Ba_2Cu_3O_{v'}$, $Er_2Ba_1Cu_1O_{w'}$, $Sm_1Ba_2Cu_3O_{v''}$, $Sm_2Ba_1Cu_1O_{w''}$, $Nd_1Ba_2Cu_3O_{v'''}$, $Nd_4Ba_2Cu_2O_{w'''}$, Y_2O_3, CeO_2, Pt, PtO_2, Ag and AgO_2, where at least one of Y, Yb, Sm and Nd may also be partially substituted by other lanthanides or Y, and wherein other related chemical elements may occur in at least one of Ag and AgO_2.

6. (Amended) A method in accordance with claim 1, characterised in that the untreated shaped body of the superconducting material, the treated shaped body of the superconducting material, the coating material and the layer of material comprise at least one of calcium and other cations which alter the band structure of the electrons and contribute to the higher critical transport current densities.

7. (Amended) A method in accordance with claim 1, characterised in that at least one of the shaped body of the superconducting material and the coating material comprise at least one gradient in regard to at least one of the chemical composition, the grain structure , the peritectic flow temperature and the peritectic melting temperature.

8. (Amended) A method in accordance with claim 1, characterised in that the coating material is applied such as to have a layer thickness in the range from 1 μm to 5 mm.

9. (Amended) A method in accordance with claim 1, characterised in that the coating material is applied in a form comprising at least one of a powder, a shaped body and a coating

10. (Amended) A method in accordance with claim 1, characterised in that a powder-like coating material is applied by a coating process comprising at least one of:

placing a shaped body of the coating material on the corresponding surface of the shaped body of the superconducting material, and

effecting the coating process from the gas phase, from a solution or suspension or by using an aerosol.

11. (Amended) A method in accordance with claim 1, characterised in that the coated shaped body of the superconducting material is maintained at said desired temperature until such time as a part of the coating material penetrates or diffuses into the superconducting material.

12. (Amended) A method in accordance with claim 1, characterised in that, during the modification of the superconducting material, a gradient is produced in at least one of the shaped body of the superconducting material and the layer of material produced from the coating material.

13. (Amended) A method in accordance with claim 1, characterised in that at least one of residual crystal nuclei, the layer of material and an uneven surface of the shaped body is mechanically removed after the modification of the superconducting material, and in that the shaped body is subjected thereafter to a heat treatment if necessary.

14. (Amended) A method in accordance with claim 1, characterised in that a shaped body of the superconducting material is produced substantially in the form of at least one of plates, solid cylinders, hollow cylinders, rings, discs, bars, tubes, wires, tapes or coils.

15. (Amended) A method in accordance with claim 1, characterised in that the shaped body of the superconducting material is in direct contact only with at least one of a superconducting material based on (Rare Earth)BaCuO and a coating material, during the firing and heat treatments.

16. (Amended) A method in accordance with claim 1, characterised in that a large-sized shaped body of the superconducting material comprises a plurality of mutually spaced crystal nuclei whose c-axes are oriented along one of the main directions of the geometry of the shaped body.

17. (Amended) A method in accordance with claim 1, characterised in that a large-sized shaped body of the superconducting material is produced in a plurality of segments, which are joined together if necessary, by heat treatment at said desired temperature, possibly by the application of pressure and possibly by the addition of a coating material to the boundary surfaces that are to be jointed together.

18. (Amended) A shaped body of a superconducting material based on (Rare Earth)BaCuO which is obtained by a method in accordance with claim 1, characterised in that it contains at least one element selected from the group consisting of Y, La, Ce, Pr, Nd, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, and in that it has a maximum value of remanent induction at 77 K and 0 T of at least 1100 mT.

19. (Amended) A shaped body in accordance with claim 18, characterised in that the alignment of the c-axes of the grains or of the one grain of a cylinder, a ring, a tube or a disc consisting substantially of one or more segments is substantially in line with an axis of the shaped body, or, it is at right angles thereto.

20. (Amended) A shaped body in accordance with claim 18, characterised in that it substantially comprises a composition of (Rare Earth)$_1$Ba$_2$Cu$_3$O$_x$ where x lies in the range from 6.5 to 7 and wherein at least one element ofRare Earth may be in excess.

21. (Twice Amended) A shaped body in accordance with claim 18, characterised in that it consists to more than 60 Vol.-% of one phase of the composition (Rare Earth)$_1$Ba$_2$Cu$_3$O$_x$ where x lies in the range from 6.5 to 7.

22. (Twice Amended) A shaped body in accordance with claim 18, characterised in that it has a critical transport current density of at least 4 10^4 A/cm^2 in the external field of 1 T at 77 K.

23. (Twice Amended) A shaped body in accordance with claim 18, characterised in that it has a fracture toughness as determined by the fracture system about the hardness impressions of at least 1 Mpa $\sqrt{m}$.

24. (Twice Amended) The use of a shaped body consisting of a superconducting material produced in accordance with claim 1 on the basis of (Rare Earth)BaCuO, for transformers, current breakers, power leads, magnetic screenings, magnetic bearings or/and as magnets,

especially as cryogenic bearings, in flywheel storage devices, in particle accelerators, in the rotors of electrical machines.

C1 25. (Amended) The use of a shaped body consisting of a superconducting material in accordance with claim 18 for transformers, current breakers, power leads, magnetic screenings, magnetic bearings or/and as magnets, especially as cryogenic bearings, in flywheel storage devices, in particle accelerators, in the rotors of electrical machines.

Please add the following new claims:

26. A shaped body as claimed in claim 18, wherein said shaped body has a maximum value of remanent induction at 77 K and 0 T of at least 1200 mT.

27. A shaped body as claimed in claim 26, wherein said shaped body has a maximum value of remanent induction at 77 K and 0 T of at least 1300 mT.

28. A shaped body as claimed in claim 27, wherein said shaped body has a maximum value of remanent induction of more than 1400 mT.

29. A shaped body as claimed in claim 21, characterised in that it consists of more than 80 Vol.-% of said one phase of the composition.

30. A shaped body as claimed in claim 29, characterised in that it consists of more than 90 Vol.-% of said one phase of the composition.

31. A shaped body as claimed in claim 31, characterised in that it consists of more than 95 Vol.-% of said one phase of the composition.

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32. A shaped body in accordance with claim 22, characterised in that it has a critical transport current density of at least 6 10^4 A/cm^2.

33. A shaped body in accordance with claim 32, characterised in that it has a critical transport current density of at least 8 10^4 A/cm^2.

34. A shaped body in accordance with claim 23, characterised in that it has a fracture toughness as determined by the fracture system about the hardness impressions of at least 1.5 Mpa $\sqrt{m}$.

35. A method in accordance with claim 8, characterised in that the coating material is applied with a layer thickness in the range from 10 μm to 3 mm.

36. A method in accordance with claim 35, characterised in that the coating material is applied with a layer thickness in the range from 50 μm to 2 mm.

37. A method in accordance with claim 9, characterised in that the coating material is applied in a form of a powder, the powder being a powder mixture or in granular form.

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38. A method in accordance with claim 9, characterised in that the coating material is applied in a form of a shaped body which is a compressed, a calcinated, a sintered or a molten shaped body.

39. A method in accordance with claim 9, characterised in that the coating material is applied in a form of a coating which is in the form of a deposited coating that is basically produced by at least one of precipitation.

40. A method in accordance with claim 1, characterised in that a large-sized shaped body of the superconducting material comprises a plurality of mutually spaced crystal nuclei whose c-axes are oriented at right angles to one of the main directions of geometry of the shaped body.

41. A method in accordance with claim 17, characterised in that said segments are joined together also by the application of pressure.

42. A method in accordance with claim 17, characterised in that said segments are joined together also by the addition of a coating material to boundary surfaces that are to be joined together.